

FIG. 1

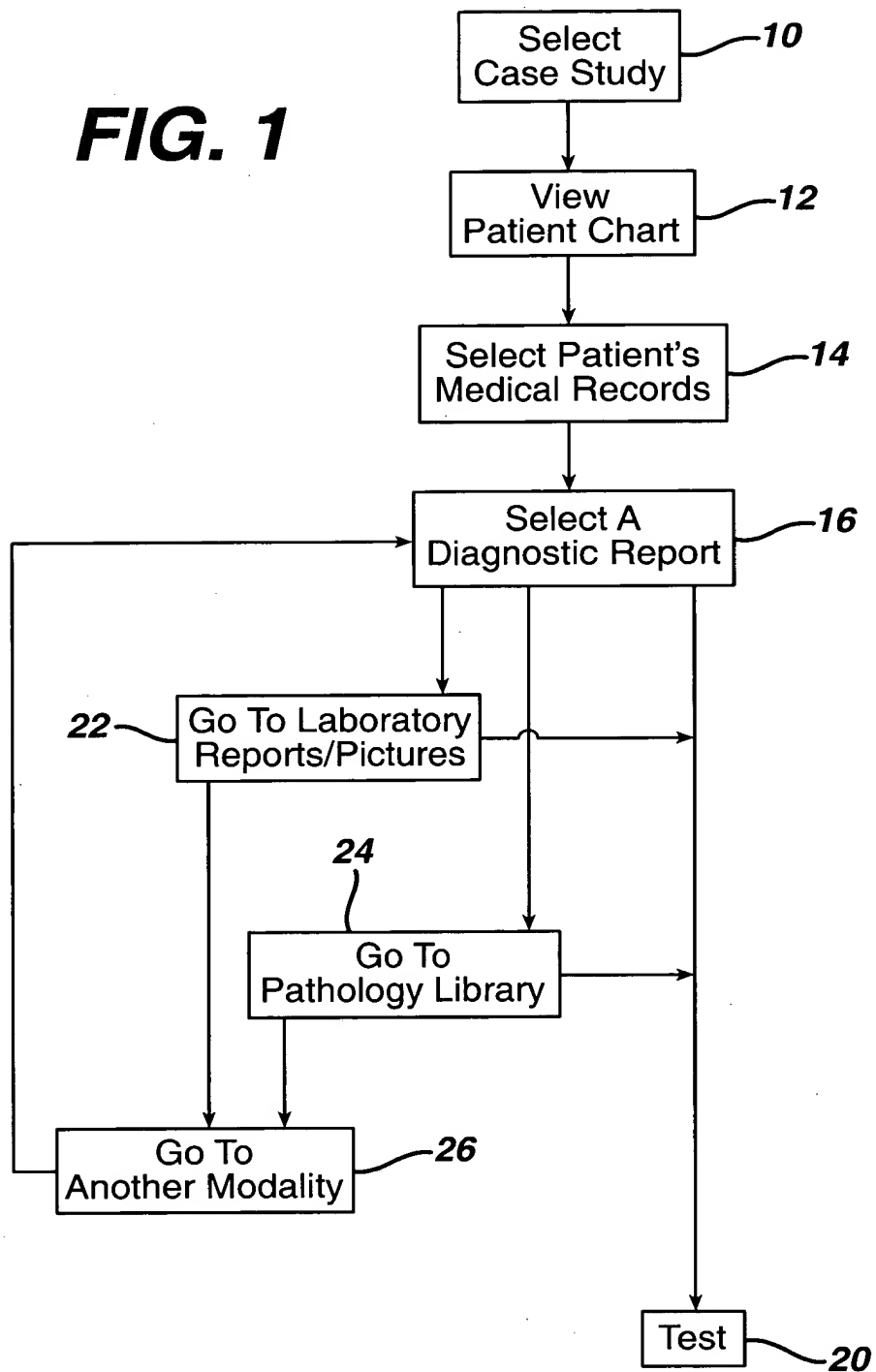


FIG. 2

File Edit View Favorites Tools Help

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Print Edit

Address <http://www.atl.com/ATLLearningCenter/OnlineCaseStudies/Vascular/vascintro.asp>

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Vascular

These case studies have been approved by the Society of Diagnostic Medical Sonographers for 1.0 credit. These credits are accepted for laboratory accreditation and are accepted by the ARDMS, AART (Category A), and AMA (Category II).

Vascular Case Study #1 - Carotid Body Tumor
Darrin Cournoyea, BSc, RDMS, RVT
Peterborough Vascular Lab, Peterborough, Ontario, Canada

Vascular Case Study #2 - Right Popliteal Artery False Aneurysm with an Arterio-Venous Fistula
Darrin Cournoyea, BSc, RDMS, RVT
Peterborough Vascular Lab, Peterborough, Ontario, Canada

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FIG. 3

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Address http://www.atl.com/ATILLearningCenter/OnlineCaseStudies/Vascular/expand/objective.asp

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The following learning exercise provides information regarding Carotid Body Tumor. The information is presented using a case study format. By reviewing the medical history and test results of several diagnostic modalities the characteristics of the pathology are examined.

Following the review of this information as well as the discussion provided in the library the learner will be able to:

1. Describe the role of ultrasound in the assessment of carotid body tumor.
2. List the typical ultrasound findings of carotid body tumor.
3. Describe the typical signs and symptoms of carotid body tumor.
4. List other pathologies that may be considered as a differential diagnosis for carotid body tumor.

At any time the personal notes button can be used to collect information regarding the pathology. These notes can then be printed as a summary of the case study for future reference. All practitioners of ultrasound can benefit from this case study review which illustrates the unique information that each imaging modality, clinical exam or test provides to reach a diagnostic conclusion.

The patient chart tabs above allow access to all test results. Please click on one to begin the case study review. When you feel you have collected adequate information from the test results and library please proceed to the test.

JES

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FIG. 5

The screenshot shows the ATL Medical Systems website. The top navigation bar includes links for File, Edit, View, Favorites, Tools, and Help. Below this is a search bar with a magnifying glass icon and a 'Search' button. The address bar shows the URL: http://www.atl.com/ATLLearningCenter/OnlineCaseStudies/Vascular/Angiography.asp. The main content area features a large banner with the text 'WE ARE ULTRASOUND' and the ATL logo. To the right of the banner is a sidebar with a 'Quick Search' box and a 'Learning Center' section. The sidebar also contains a 'View Library' button and a 'TEST' button.

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View Library

Medical Records Laboratory Pathology Nuclear Medicine X-Ray MRI Angiography Ultrasound Computed Tomography

TEST

Examination Report- Cerebral Angiography

The study was carried out from a right femoral puncture and no complications were encountered. At the end of the procedure, the patient had noticed some numbness in the right foot. This actually had occurred during the examination, fairly early on and this was likely due to a partial anesthesia of the femoral nerve.

The patient developed a bit of numbness in the right hand, predominantly in the third periphery of the digits towards the end of the procedure. This may have been related to spasm in the left vertebral artery, which did occur during the examination. It is possible that a small embolus occurred during catheterization of the left cerebral vessels, but her vessels are quite smooth and the catheterizations went quite easily. In any case, both of these symptoms were resolving as the patient was being observed in the surgical outpatient unit.

Selective right carotid and right vertebral angiography revealed relatively normal vessels. In particular, there was no collateral flow from branches of these vessels over to the lesion adjacent to the left carotid bifurcation.

Selective left vertebral angiography did not reveal any abnormalities or supply to the above mentioned left carotid bifurcation tumor.

FIG. 6

The screenshot displays the ATIL Learning Center website. The top navigation bar includes links for File, Edit, View, Favorites, Tools, and Help. Below this is a standard web browser interface with a Back button, a Forward button, a Stop button, and a Refresh button. The address bar shows the URL: <http://www.atil.com/ATILearningCenter/OnlineCaseStudies/Vascular/pathandlab.asp>.

The main content area is divided into several sections:

- WE ARE ULTRASOUND**: A large banner with the ATIL logo and the text "A Philips Medical Systems Company". Below the banner is a navigation menu with links: About Us, Customer Care, Product Solutions, Advanced Apps, Learning Center, and Employment.
- QUICK SEARCH**: A search bar with a magnifying glass icon and a "View Library" button.
- Learning Center**: A section with a list of links: Case Studies, About Learning Center, ATIL Conferences, Resource Guide, Interactive Learning, Image Library, and Protocol Guides.
- Pathology Report**: A section titled "Pathology Report of Left Neck Mass". It contains a "Gross" description of a specimen and a "Microscopic" description of the lesion.
- DIAGNOSIS: CAROTID BODY TUMOR (PARAGANGLIOMA)**: A section with the title "Blood and Urinalysis Laboratory Results".
- Blood Results**: A section with the title "Urinalysis Results".
- Result Reference Range:** A section with the title "TEST".

The "Gross" description states: "The specimen is submitted in a single container and consists of a fleshy burgundy colored portion of tissue measuring up to 1.5 x 1.1 x 0.8 cm. Tissue weighs 1.0 gm. On sectioning, a firm kidney-bean shaped area is present measuring 1.1 x 0.7 cm. The cut surface is tan/red in color."

The "Microscopic" description states: "Sections show a well circumscribed encapsulated lesion surrounded by fibrovascular stroma. The lesion appears to be completely excised."

The "DIAGNOSIS" section states: "It consists predominantly of cords of cells in a markedly vascular stroma. The cells have oval to irregular nuclei with finely granular chromatin and small nuclei. Zellballen pattern is focally evident."

FIG. 7

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Address <http://www.atl.com/ATLLearningCenter/OnlineCaseStudies/Vascular/library.asp>

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Library

Discussion on Carotid Body Tumors

What is a Carotid Body Tumor?

A carotid body tumor (CBT) is a neoplasm of a carotid body chemoreceptor located at the bifurcation of the common carotid artery into the internal carotid and external carotid arteries. The normal size of a carotid body is 5 x 3 x 2 mm. This slow growing tumor has a rich vascular supply fed primarily by the ECA and its branches. The vertebral and thyrocervical arteries can also feed these tumors. Percutaneous needle aspiration of these tumors is strongly contraindicated due to the risk of hemorrhage. The tumor does not have a true capsule but is well circumscribed. Its color is reddish brown and has a rubbery consistency. The tumor sits in the notch between the ICA and ECA, therefore as the tumor grows it plays these arteries.

CBTs have been classified and described into 3 groups based on anatomic observations. Group I tumors are small and easily removed because they are not well adhered to the carotid vessels. Group II tumors are moderately larger with more difficult surgical excisions due to more extensive attachments. Group III tumors are very large and completely involve both the ICA and ECA. Complete arterial resection and grafting is often necessary.

CBTs are slow growing benign tumors that may be familial (autosomal dominant) or idiopathic. CBTs are usually unilateral but can also be bilateral with a 5% incidence for sporadic tumors and a

FIG. 8

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Address <http://www.atl.com/ATLLearningCenter/OnlineCaseStudies/Vascular/test.asp>

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| TEST | |
|------------|--|
| Question 1 | <p>The following test is multiple choice. Select the answer for each question by clicking on the button preceding your choice. A passing score is 70% correct answers.</p> <p>The vascular area demonstrated with the angiogram at the left carotid bifurcation would most likely be fed by?</p> <p> <input type="radio"/> Branches off the internal carotid artery <input type="radio"/> Branches off the external carotid artery <input type="radio"/> Branches off the vertebral artery <input type="radio"/> Branches off the thyrocervical artery </p> |
| Question 2 | <p>The carotid body tumor is typically located between the:</p> <p> <input type="radio"/> vertebral and subclavian arteries <input type="radio"/> carotid and subclavian arteries <input type="radio"/> external carotid and common carotid arteries <input type="radio"/> external carotid and internal carotid arteries </p> |
| Question 3 | <p>A carotid body tumor can be identified with ultrasound as</p> |

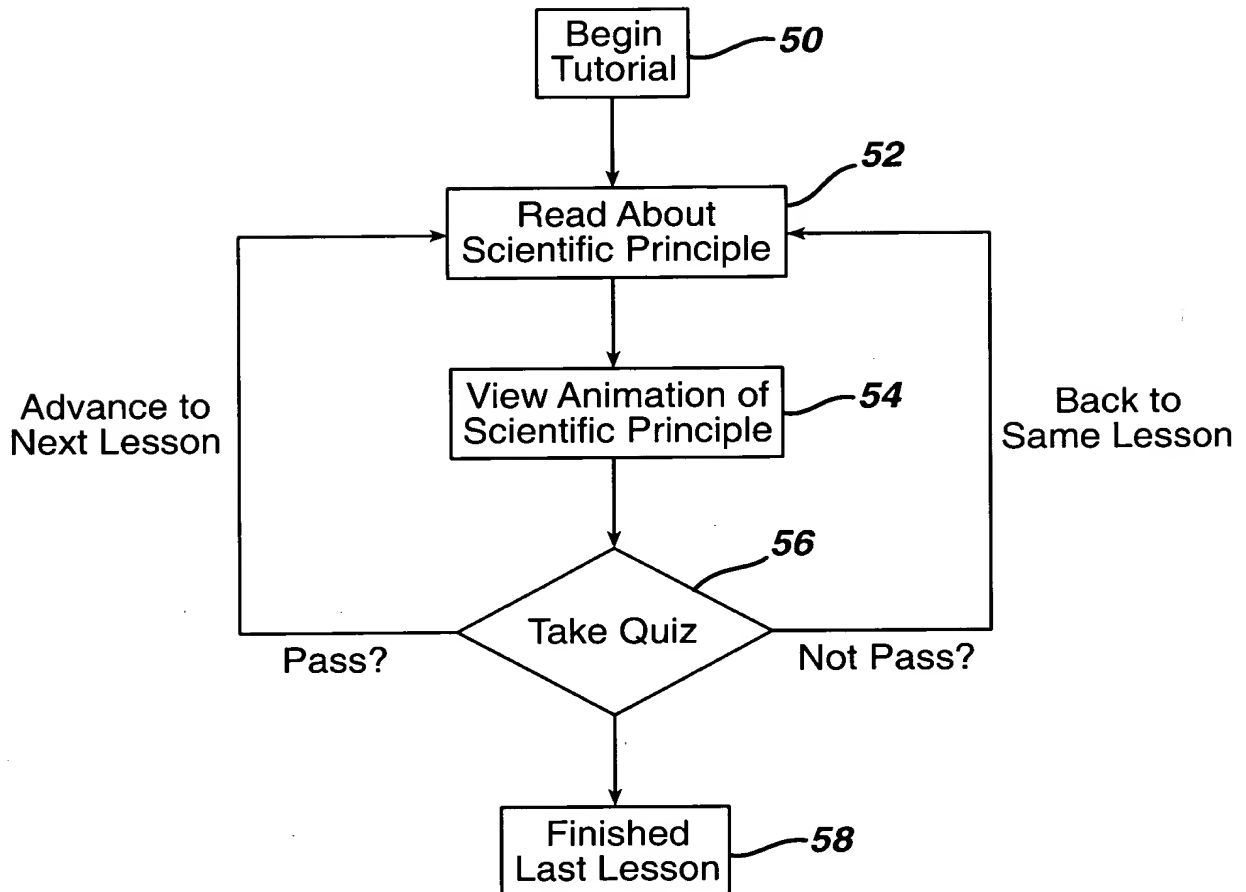
FIG. 9

FIG. 10

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Address <http://learn.phona.com/phona/module/main.asp?mid=244&mcscsid=FX2G730P2CSR2GF400J74MQW04D79E68>

Doppler in Ultrasound Applications : Home Page

OBJECTIVES OUTLINE SEARCH GLOSSARY TEST HOME

Doppler in Ultrasound Applications

You have until September 12, 2001 to pass the test for this module before it expires.

LEARNING OBJECTIVES
A concise overview of the current module.

OUTLINE/STUDY CONTENT
Displays a listing of the topics. Please review *all* of these topics before taking the assessment test.

SEARCH
Search by keyword or phrase.

GLOSSARY
Vocabulary for the current module.

ASSESSMENT TEST
Once you have studied all sections in this module, click here to take the test.

Doppler in Ultrasound Applications

FIG. 12

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 Address
 http://learn.phonena.com/phcna/module/section.asp?mid=244&sid=1558&mcsid=FX2G73DP2CSR2GF40074MQW04D79E88

Doppler in Ultrasound Applications : Study Content

OBJECTIVES OUTLINE SEARCH GLOSSARY TEST

YOUR HOME

Doppler Effect
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Pulsed Wave Doppler

Pulsed wave Doppler ultrasound uses a single piezoelectric crystal for both transmission and reception of sound waves. The system transmits short pulses of sound waves at regular intervals. It then waits for a specified time and only then receives signals from a certain depth. This is similar to pulse-echo imaging. Using this technique, the depth from which the signal originated can be calculated.

A
transmit

B
wait

C
receive

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FIG. 13

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http://learn.phcna.com/phcna/module/section.asp?mid=244&ssid=1060&msscid=FX26730P2C5R26F400U74M/QW/04D79E6B

Doppler in Ultrasound Applications : Study Content

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Doppler Effect

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Magnitude of Doppler Shift

NEXT PAGE

Quiz

Race fan 2 is here X

Race fan 1 is here X

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FIG. 14

Address: <http://learn.phcna.com/phcna/module/section.asp?mid=250&aid=1569&mssid=FX2G73DP2CSR20F40074MQW04D79E6B>

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Doppler Ultrasound Signal Analysis and Optimization : Study Content

OBJECTIVES OUTLINE SEARCH GLOSSARY TEST YOUR MODULE HOME

Analysis of Doppler Signal

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Maximum Velocity Measurements

The Doppler equation can be used in duplex imaging to convert frequencies into velocities. This is because the angle between the Doppler beam and the blood vessel can be estimated. Analysis of the components of the Doppler waveform shows that many velocities are displayed in the spectrum and these velocities vary with time, due to the cardiac cycle.

The value most commonly used for the measurement of velocity is peak systolic flow. This is the maximum velocity in the spectrum at peak systole. Maximum velocity can also be measured at end diastole. These velocity measurements represent the fastest moving blood flow in the center of the vessel and do not include the slower moving flow near the vessel wall.

80

Drag the red dot into the highlighted area and drop it

TS: 05 140.03
Pr: #237 12:24m
E0150 am
230
230
SW Angle -38°
Dop 6.3 cm
9.24 4.0 mm
Freq 3.5 MHz
WF Low
Dop 67% Map 2
PRF 6250 Hz

COLON Map 1
WF Mid
PRF 1500 Hz
Flow Opt Map V